

The Rise of The Prototyping Paradigm

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Complex Social Challenges, The Impulse to Help,
How It Fails and How It Can Succeed Again

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– Poor little birds
– We are hungry too!!!

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THE HELPING IMPULSE

How effective have efforts to address complex social challenges in the post-war era been?

In the sixty years since the end of the Second World War the impulse to solve the world's most complex challenges has been growing steadily. We now live in a world where efforts to address poverty, inequality, food and water insecurity, the lack of healthcare, environmental damage, climate change, and many other issues are steadily growing. More resources, more talent, and more attention, is being dedicated to these issues.

Governments are increasingly under pressure to deliver on a changing social contract, to provide what actually turn out to be a very complex array of services. Pressure on governments comes from multiple domains. The information revolution has led to greater information flows allowing citizens to compare the performance of their governments (think of The Economist ranking countries). Civil society, where muscular, plays an important role in holding governments to account. Where weak, civil society at the very least acts as an early warning system, often at great risk to activists, raising issues at the international level.

Multilateral organizations, such as the UN and associated agencies bind sovereign governments in treaty obligations, which technically at least, are legally binding instruments. These treaties also exert a significant influence on the trajectory of the helping impulse globally, being responsible for the strategic direction that many organizations take.

Philanthropy continues to grow from its humble roots in charitable giving. Increasing amounts of money are being spent in the non-profit sector, as millionaires and billionaires look to deploy their wealth to address complex challenges.

Then finally, the for-profit world has embraced the helping impulse primarily through the promise of social entrepreneur

ship. The power of the markets promise to unlock innovative new responses underpinned by capital flows driven by the profit-motive coupled with a desire for social impact.

As an impulse, the desire to help our fellow human beings is difficult to question or refute. The helping impulse is therefore an impulse that commands great power, animating a great number of people and institutionsⁱ⁾.

The "Third Wave" Helping Impulse

What does the helping impulse hope to achieve?

Historically the goal of the helping impulse was to support people meet their basic requirements for subsistenceⁱⁱ⁾. These subsistence requirements can be reduced to "six ways to die"ⁱⁱⁱ⁾ – too hot/too cold, too hungry/too thirsty and too ill/too injured. The helping impulse focused on ensuring that people had adequate supplies of food, water, shelter and medical care. Imagine the historic patterns of "Christian" charity – food for the hungry, shelter for the homeless and care for the sick. This was the first wave helping impulse that lasted from antiquity, the era of the Good Samaritan, till the Second World War, the era of development. The Marshall Plan can be thought of as the final act of this era^{iv)}.

The growth of the helping impulse in the post-war period has taken us well beyond efforts to meet subsistence requirements. In the post-war years it was no longer politically acceptable to aim simply for subsistence. The goal of the helping impulse ostensibly became to raise people from subsistence levels of existence to middle-class levels of livelihood, with attendant "rights."^{v)}

Attempts to provide human rights, education, gender equality or access to information technologies are all part of what can be thought of as this "second wave" of the helping impulse. This second wave lasted some forty years from the post-WWII period until roughly the early 1990s when the first glo-

bal environmental treaties were proposed.

In addition to requirements that are secondary and tertiary to subsistence, we now have an awareness that environmental limits must factor into our efforts.

We know that we cannot meet “second wave” requirements (subsistence plus secondary goals) simply by increasing production of increasing use of fossil fuels. “Development” is therefore now required to be “sustainable.” This gives rise to the “third wave” helping impulse, which is where we currently find ourselves.

The Trifecta: Subsistence, Livelihoods & Environment

The trifecta of meeting subsistence needs, and achieving a certain quality of life while respecting environmental limits then forms the core challenge that the current third wave helping impulse aspires to address. This trifecta has given rise to a milieu characterized by complexity. It is the helping impulse in the context of this complexity that we propose to examine for efficacy in this paper.

The sheer magnitude of resources dedicated to addressing this trifecta of challenges should give us pause. The financial, political and social capital now directed by the helping impulse is historically unprecedented. While this is a fact worth celebrating, it gives rise to deeper, more troubling issues.

A FLAGSHIP THIRD WAVE STRATEGY

The MDGs were a set of eight development goals set by the then 183 United Nations member countries following the Millennium Summit in 2000. It consisted of eight goals with 21 targets with a set of measurable health and economic indicators for each target, which were to be achieved by 2015.

The MDGs represent a flagship for third wave helping strategies. While the specifics of the MDGs can and have been debated, the Goals as an overall goal have been ratified as part of the UN treaty process. This means that the world’s nations have signed up to them and they have served to influence “helping” for almost two decades.

In this paper we treat the MDGs as a paradigmatic response to complex social challenges.

What are the MDGS?

The eight goals cover extreme poverty, universal primary education, gender equality, the reduction of child mortality, improvements in maternal health, combating HIV and AIDS and other diseases, environmental sustainability and establishing a partnership for development.

The UN assessed whether a country was on track or off track to meet the goals, but comparing observed rates of progress to rates required to meet targets.

Progress on the MDGs

The MDGs have been measured since their implementation. At the outset a considerable MDG monitoring apparatus was quickly established, which has provided a near-continuous update on progress towards the achievement of the eight MDG goals via their subsidiary 22 targets and 43 indicators. How the targets are measured, has been a cause for debate with scholars arguing that the measurement of targets should take into account countries’ starting level, otherwise the least developed countries are without hope of meeting the targets, despite how their performance compares with their peers or track record ^{vi)}.

Progress on the MDGs has been varied. Estimates for the developing world indicate that the targets for extreme poverty reduction (MDG 1.a), access to safe drinking water (MDG 7.c) and improving the lives of at least 100 million slum dwellers (MDG 7.d) have been reached ahead of the 2015 deadline. The targets on gender equality in primary and secondary education and the incidence of malaria are projected to be met by 2015, although gender disparity remains prevalent in higher levels of education ¹⁾.

The extreme poverty rate has been halved between 1990 and 2015. Despite the overall achievement, specific regions have lagged behind on reducing extreme poverty, for example Sub-Saharan Africa and South-eastern Asia. In developing regions the goal of

universal primary enrolment has not been achieved as drop out rates and numbers of children not in school remain high.

MDG "Failure": Treating Maternal Mortality As A Technical Problem

There have been important improvements in maternal mortality in recent decades, as illustrated by the examples in the table below:

Maternal Mortality Rates (MMR)
(per 100,000 live births)

Country	1990	2010
Bangladesh	550	170
Burkina Faso	770	400
Cambodia	1,200	170
Haiti	670	380
Honduras	290	120
Morocco	310	120
Tajikistan	68	44

Source: Maternal Mortality Estimation Inter-Agency Group – Trends in Maternal Mortality: 1990 to 2013

However, despite these significant progresses, maternal mortality still constitutes one of the world's major development challenges. Maternal mortality is the main health indicator with the biggest gap between rich and poor countries: the lifetime risk, i.e. the chance of a woman dying during pregnancy and birth, is 1/15 in Chad while it is only 1/12,000 Greece (2013 data); in 2013, the MMR in Chad was 980 per 100,000 live births, while in Belarus it was only 1. Not surprisingly, 99% of maternal deaths occur in developing countries^{vii)}.

The significance of the problem is compounded by the fact that, in clinical terms, the strategies necessary to reduce maternal mortality are known^{viii)}, or as stated by UN Secretary General Ban Ki-moon: "we know what works"^{ix)}.

This paradoxical context raises two obvious and direct questions: One, if we know

what works, why is it that there are approximately 290,000 maternal deaths every year, nearly all of them avoidable?^{x)} Two, if we know what works, why is it that we have made less progress on MDG 5, improving maternal health, than any other Millennium Development Goal, and it is likely that it will not be achieved?²⁾

This patent paradox has not escaped the UN and the other multilateral agencies, which have launched in 2010 a "Global Strategy for Women's and Children's Health,"^{xi)} supported by the H4+ Global Initiative to Accelerate Support for Maternal and Newborn Health, a partnership between UNAIDS, UNFPA, UNICEF, UN Women, WHO and the World Bank, which functions as the Strategy's technical agency. The Global Strategy defines four "key areas where action is urgently required to enhance financing, strengthen policy and improve service delivery":

- "support for country-led health plans, [through] increased, predictable and sustainable investment";
- "integrated delivery of health services and life-saving interventions – so women and their children can access prevention, treatment and care when and where they need it";
- "stronger health systems, with sufficient skilled health workers at their core"; and
- "innovative approaches to financing, product development and the efficient delivery of health services."

UNICEF has recently published a compendium of "Innovative Approaches to Maternal and Newborn Health"^{xii)}. The sixteen case studies presented, describe policies, strategies and interventions from thirteen countries that have shown promising results for improved health outcomes³⁾. The innovations identified include the use of mobile phones and short message services (SMS), training of health workers using mannequins, service upgrades and changes in financing/payment mechanisms and many others.

Most maternal health policy proposals, including the Global Strategy and those

identified by UNICEF, are based on the empirical evidence available indicating that a set of (known) essential interventions can prevent the majority of maternal and newborn deaths, which leads to the policy implication that all that is needed to solve the maternal mortality problem is the provision of the means (inputs) necessary to deliver these services with the appropriate quality and scale. It is, therefore, not surprising that these proposals continue to emphasize supply-side interventions. For example, of the sixteen UNICEF case studies, only two can be described as being focused on demand behavior and actions.

The fact that maternal mortality continues to be an unresolved issue, suggests that the consolidation and coordination of efforts, the scaling up of supply-side interventions, and the increase of resources are not sufficient to bring the required change. A truly new strategy is required.

The “traditional” proposals fail to recognize that, even though the technical and financial agencies may know what works, they do not have the full picture, or don’t know how to implement the required change.

The process of designing, implementing and delivering maternal health services and interventions involves several stakeholders other than the government: patients, communities, service providers, workers, suppliers, etc. The fact that they all are the actual “clients” of any proposed measure must be recognized and their perspectives incorporated if an intervention is to be effective.

In other words, treating maternal mortality as a complicated technical problem to be solved does not work.

THE FALL OF THE PLANNING PARADIGM

Evaluating Third Wave Strategies

Evaluating third waves strategies for efficacy is extremely difficult^{xiii}. Reporting on, for example, the performance on various MDGs is done linguistically in five categories (achieved, on track, very likely to be achieved, possible to achieve if some changes are made, and off track) without

any references to the resources invested in order to achieve performance^{xiv}.

This disaggregation of data means that it is often impossible to tell if data even exists. So for example, a typical “traffic light” evaluation of the MDGs shows that parts of Asia (East) are on track to meet almost all their MDG targets. But how much did these results cost? What were the initial estimated costs? In contrast none of the targets for Sub-Saharan Africa are on track. How can we compare performance between these two regions? How can we estimate the success or failure of result without any sense of the inputs?

In general, without input data it is impossible to make any statistically valid studies on the effectiveness of the instruments used to implement third wave flagship strategies. This informational opacity is a dominant characteristic of third wave strategies.

One estimate on cost for the implementation of the MDGs, comes at \$40-60 billion a year^{xv}, which over the 15-year span of the MDGs is \$600-900 billion.

One suggested target required “to implement the target” was of “the industrial countries” providing Overseas Development Assistance (ODA) equal to 0.7 per cent of their GNP, which fits roughly with the World Bank estimate of cost.

Responsibility for implementation of the MDGs, Kyoto Protocol and the Aichi targets (and next-gen treaties such as the SDGs) falls principally on sovereign nations, with bilateral and multilateral support.

Investment in meeting an MDG target, or an environmental target, will often be bundled into the budget for the appropriate ministry, for example healthcare, education, environment, or in some cases finance. At the national level, therefore, expenditure on MDGs is bundled into several budgets. In other words at a national level the data is insufficiently disaggregated, making it hard to quantify exact expenditure.

Third Wave Strategies as Megaprojects

The approach of treating complex challenges as technical problems finds its highest expression in the form of the megaproject.

Megaprojects are defined as “...large-scale,

complex ventures that typically cost US\$1 billion or more, take many years to develop and build, involve multiple public and private stakeholders, are transformational, and impact millions of people.”^{xvi)}

Taken in aggregate the size of flagship third wave strategies, such as the MDGs, Kyoto and Aichi, fall into the “gigaproject” category, costing hundreds of billions of dollars. When disaggregated to national regional or sovereign efforts, these strategies can be located in the “megaproject” category.

Professor Bent Flyvbjerg at the University of Oxford has studied the phenomenon of megaprojects, conducting a number of statistically significant studies. He demonstrates that, “Success in megaproject management is typically defined as projects being delivered on budget, on time, and with the promised benefits. If, as the evidence indicates, approximately one out of ten megaprojects is on budget, one out of ten is on schedule, and one out of ten delivers the promised benefits, then approximately one in one thousand projects is a success, defined as “on target” for all three. Even if the numbers were wrong by a factor of two—so that two, instead of one out of ten projects were on target for cost, schedule, and benefits, respectively— the success rate would still be dismal, now eight in one thousand.”

He goes on to coin “the iron law of megaprojects,” “Over budget, over time, over and over again.” There is no reason to suppose that third wave helping strategies somehow miraculously break the iron law of megaprojects. (Given that the implementation of the MDGs rests with sovereign nations, many of whom are responsible for the same megaprojects that Flyvbjerg et al. examine, it’s a fair assumption to make that the iron law has not somehow magically been broken.) What does this tell us about the performance of the MDGs?

If we examine the aggregate performance of the MDGs, 8 goals, 16 sub-goals, across 9 regions, a total of 76 are off target versus 68 on target, which gives us a 47% on target “success rate.”^{xvii)}

If we examine the three parameters of time, scope and cost, then time is not a variable as the MDGs are time-bound, with a fixed-target date of 2015. This means that if

the work is to be defined as “successful” by coming in “on time” then the two variables of scope and budget need to be examined for efficacy and performance measures.

The original estimate of what the MDGs would cost in 2002 was \$600-900 billion. In the absence of actual budget data, given the iron law, we can expect that only 1 in a 1000 third wave projects came in on budget. Flyvbjerg observes that, “overruns of up to 50% in real terms are common, and above 50% not uncommon.”

This implies that had the MDGs been 100% “on time,” achieving “promised benefits” (i.e. all targets met) then the “iron law” would mean cost overruns in the trillions of dollars.

While it’s impossible to rule out entirely that such cost overruns were not made (they could for example be buried in sovereign budgets) such unexpected costs would have been larger than the 2008 bailout of the financial sector.

A few extra trillion dollars of unplanned spending on the MDGs between 2000-2015 would likely have been noticed. In other words, it may well be possible that the original estimate of \$600-900 billion was met (although unlikely, given most countries did not meet their 0.7% ODA targets), it’s highly unlikely that a few extra trillion dollars went to cost overruns relating to the MDG targets. In other words, the “option” of 50-100% cost overruns typical to megaprojects were not afforded to the MDGs. This means that the only variable explaining failure of the MDGs is scope, that is, the promised benefits were not delivered, which is indeed the case.

With the MDGs the deadline was a political deadline, whereas with Kyoto, the CBD and any future climate treaty, the deadline is to a large extent a scientific one. A failure to meet targets, say for curbing global CO2 limits, or species loss, has hard consequences – even if they might be difficult to predict with accuracy.

In other words, if we accept the science, then the temporal horizon for environmental targets is non-negotiable. This in turn means that at least technically the scope of the work undertaken has to deliver on clear quantifiable targets.

Even so, the scope of work for meeting environmental challenges is characterized by multiple pathways. While these multiple pathways provide some degree of flexibility, as we continue to fail to meet environmental targets, the pathways become fewer and fewer.

The only variable with any real elasticity is the financial. Unfortunately, this is where the most serious distortions in both planning estimation and execution occur.

The Problem of Tactical Lying

From their examination of megaprojects, Flyvbjerg and his colleagues have pointed out “the megaprojects paradox,”^{xviii} where while there is an increase in the number of infrastructures projects being proposed and build, “many such projects have strikingly bad performance records in terms of economy, environment and public support.” This megaproject paradox extends to third wave strategies to complex challenges. Let us examine the logic at play here.

The trifecta of challenges that third wave helping strategies are attempting to address means that the stakes are extremely high, politically, financially and ethically⁴.

Into this context comes the practice of systemic underestimating of costs and overestimation of benefits that we have seen with, for example, the MDGs.

This phenomenon is known as “optimism bias.” It has been described in business and administrative analysis as a “systemic fallacy in planning and decision-making under which people underestimate the costs, completion times, and risks of planned action, whereas they overestimate the benefits of the same actions.”^{xix}

The key question raised by optimism bias is if optimism bias is a form of deliberate misrepresentation or what could be thought of as “tactical lying”^{xx}?

In other words, if the true costs, for example, of mitigating global CO2 emissions were known, or the cost of actually lifting 1.3 billion out of poverty, then the reasoning goes that no one would ever start the work. These stakes lead us to believe that the prevalence of optimism bias where complex challenges are concerned is a form

of tactical lying. The prevalence of tactical lying leads to two problems that undermine democratic efforts to address complex social challenges.

The first is starting work that is economically unviable. In other words, many projects that should not have been started because they make little economic sense to get started, do unfortunately get started.

The second is that investment is not made in another project that could have delivered higher yields, because actual costs and yields are not known.

The core assumption made in undertaking the route of tactical lying is to link the urgency of the challenge to the primacy of a proposed solution. In other words, proponents of a response make the assumption that there are no other effective responses. This, given the scale of resources being deployed is a startling assumption.

According to Nicholas Naseem Talib & Constantine Sandis, “In an opaque system fraught with unpredictability, there is, alas, an incentive and easy opportunity for operators to hide risk: to benefit from the upside when things go well without ever paying for the downside when one’s luck runs out.”^{xxi}

While this opacity somewhat lessens at the national level, unfortunately the system is still characterized by a degree of informational opacity that makes accountability difficult^{xxii}.

THE RISE OF THE PROTOTYPING PARADIGM

The Frontier of Complexity

“Science has explored the microcosmos and the macrocosmos; we have a good sense of the lay of the land. The great unexplored frontier is complexity.”⁵

The experience of complexity in society is not uniformly distributed. Some sections of society have experienced complexity earlier than others. This also means that responses and strategies to cope with complexity are not uniform, some people are better at it than others.

The reduction of complex challenges to technical problems is one of the most problematic characteristics of third wave strate-

gies, with the maternal mortality case being a good example. Technical problems are then amenable to a certain type of technocratic response, which rests in the planning paradigm.

Examining our experience of complexity, we find that the software development industry is one of those sectors of society that very early hit unprecedented levels of complexity.

As the software industry evolved its responses to the increasing complexity of software development, it also evolved a particular set of capacities and a particular, if you like, technical mindset more suited to dealing with complexity. Purely technical strategies are not in themselves sufficient to respond effectively to complexity, but they are orders of magnitude more effective than purely technocratic responses based on a mechanical understanding of the world.

The Two Worlds of Waterfall Versus Agile

A clear example of the shift from a “traditional” approach to one better suited to complexity comes in the shift from the waterfall approach to agile approaches. Third wave responses are structured according to a waterfall response.

The Waterfall approach takes a linear, top-down, step-by-step, documentation-dense, phased approach to designing a product – originally, software.

In the world of third wave helping strategies, the waterfall response involved a similar linear, top-down, step-by-step phased approach to delivering an intervention. In essence, a small group of experts design the intervention, then implement it and then, at least in theory, evaluate it. But as we have seen with third wave megaprojects, this evaluation is typically characterized by information opacity⁶⁾.

In contrast to the waterfall is the agile approach. Launched in [date] the Agile Manifesto brought together a small group of software developers who say that they were “...driven by “the need for an alternative to documentation driven, heavyweight software development processes” —which is how the waterfall methodology was (and is) frequently characterized.”^{xxiii)}

Instead of taking a linear development approach, agile is iterative and cyclical, with each phase of the design process taking place within a short cycle, sometimes lasting only weeks. Instead of being documentation-dense (as many third wave strategies are) agile approaches attempt to generate value for customers, or end-users, as soon as possible. In contrast, a waterfall response will not generate any value to an end-user until the design and implementation phase is complete, in some cases many years into an intervention.

Why were agile approaches so well suited to complex social challenges? Agile as an approach arose from practitioners trying to figure out a better way of developing software that was getting exponentially more complex day by day. The conditions for which agile was developed are similar to the context in which we were developing prototypes.

As an approach to managing work, BDUF, the Waterfall and traditional planning based approaches represent a “fragile” approach. Fragile, in the sense that the more stress put onto the system the more likely it was to buckle and break. The planning based approach finds its highest political expression in the Soviet Union, an entity that lived and died by planning. As our context becomes more obviously complex, we will see increasingly awareness that neo-Soviet approaches put us squarely on the road to collapse.

Agile on the other hand represents an “anti-fragile” approach^{xxiv)}. In the midst of uncertainty, change and complexity, agile teams if properly set-up get stronger. Their “muscles” improve from practice and teams get better and better at internalizing agile processes and delivering value, in multiple forms of capital. Finally, agile processes are all about timely responses to the unplanned event in order to create more value.

Agile demands multiple shifts in perspective, ranging from how we work with clients to how we promise and deliver on results. For experienced project managers and clients, each of these shifts doesn’t necessarily make sense. The other reason why agile is difficult in practice is that agile approaches demand discipline. And this discipline is

hard.

The difficulties were both external and internal. External is that we had to understand and master a different way of working, with different processes and protocols, where it was not obvious what to do. Internal in that we had to do things that did not make sense to us, so provoking emotional reactions and resistance.

The Rainforest

Silicon Valley represents a mature prototyping culture. It is in essence an ecology that has evolved to support and reward prototyping, that is, an experimental approach towards the creation of new technology ventures.

Venture capitalists and entrepreneurs Victor W. Hwang and Greg Horowitz set out to answer these questions: What makes a place like Silicon Valley tick? In doing so, they created a model for innovation ecosystems called The Rainforest, which “nurtures budding ideas so they can grow into flourishing and sustainable enterprises.” They explain, “The Rainforest model is more than a metaphor. Innovation ecosystems are not merely like biological systems; they are biological systems.... Human systems become more productive the faster that the key ingredients of innovation— talent, ideas, and capital— are allowed to flow throughout the system.”^{xxv}

The rules for fostering healthy biological environments such as rainforests are very different from those for a planned plantation.

Third wave strategies, in many ways, are the fruit of carefully planned plantations. The environment that generates third wave strategies is an environment that supports a certain planned response. The trouble is that as the world has moved on, this environment is out of step with the wider world.

The Prototyping Paradigm

Mohammad Yunus, the founder of Grameen Bank tells the following story, “In 1976, I lent \$ 27 to 42 people to help them get out of these unfair deals. People who received my money were very happy. Seeing how easy it

was to make so many people so happy with such a small amount of money, I thought I should work out a way to find money for them in a permanent basis. So I went to the bank to arrange loans for them. Bank said they cannot give loans to the poor people because they are not creditworthy.

So I thought I should take upon myself to find out whether their conclusion was right. I offered myself as a guarantor and took loans for the poor people. Tried some simple ways of handling these loans. They worked. Everybody paid back their loans.

This triggered a whole series of experimentation - from one village to 5 villages, then to 20 villages, fifty villages, hundred villages. Every time it worked. But conventional banks did not want to change their minds.

Finally, in 1983, we created a bank of our own. Now we work in 37,000 villages of Bangladesh. Bangladesh has a total of 68,000 villages. We now lend out to 2.2 million borrowers, 95 per cent of them are poor women. Our repayment rate has remained over 98 per cent.”^{xxvi}

This story illustrates the nature of prototyping, at the heart of which sits trial and error. Over the last decade we have seen an increase in the number and scale of prototyping responses^{xxvii}.

The prototyping process, when applied to complex social challenges, means running a prototyping programme, where multiple prototypes are run in parallel.

One way of understanding the function of this programme is to explore a promising solution space. Each prototype represents a line of enquiry that churns out data about how best to create value with regards to the complex challenge being faced.

Successful prototyping programmes therefore require a certain maturity when it comes to sharing learning and results. In the natural sciences the peer review and publications regime (flawed as it is) provides a mature information ecology, where results from experiments are shared across a community. This information ecology does not yet exist when it comes to complex social challenges.

The details of experiments rarely make it out from the event horizon of organisa-

tions. Failure signals from experiments do not make it “out.” Analysis of failure, if ever done, is kept squarely within organisations.

If prototyping as an approach is going to fulfil its promise of addressing complex social challenges then it will have to develop an attendant information ecology.

Idea versus Live Prototyping

It’s worth making a distinction between prototyping models that illustrate an idea and live prototyping.

When prototyping a model for an idea, usually a physical model, there are four possible outcomes from the process of coming up with a physical prototyping and testing that with stakeholders:

1. An idea is deemed as mature enough to be “live” prototyped.

This means that an idea is judged to be ready for users, to hold enough promise for providing real value.

2. An idea requires further prototyping.

This means that it is not clear that the idea is mature enough to justify building a working model but holds enough promise to be further iterated.

3. An idea generates a new idea.

In this situation, learning from building the prototype has resulted in an entirely new idea, which in turn requires prototyping.

4. An idea is abandoned.

In this situation feedback has revealed a fatal flaw in the initial concept and it is clear that the idea cannot be implemented. This is as successful an outcome as any of the others as it means not investing heavily in an idea that will certainly fail expensively at a later stage.

Taking a prototype live is different from piloting. The purpose of a prototype is to provide value to whomever is deemed a beneficiary. The process of prototyping involves iterating the service or product in order to get as quickly as possible to a situation where real value is being generated.

In contrast to a waterfall model, with a live prototype, value is discerned as not being what the designers of the prototype

deem is value but what the end users are saying.

This early engagement with end users leads to a core principle of prototyping, “fail early, fail often.”

What this means is simply that it’s better for a bad idea to fail early than for a bad idea to suck up resources and fail late. The ultimate end point for bad ideas that continue to be invested in is that they become “too big to fail.”

The Growth of Prototyping

Social entrepreneurship, social innovation, social labs, and design thinking all represent the rise of prototyping as a response to the complexity we find ourselves in. They are labels for a practice. The core of this practice is essentially trial and error.

The fact that we are working on complex social challenges means that the nature of prototyping is different than say prototyping a new toothbrush (or any product).

The word “social” means that the process of trial and error must be conducted in genuine partnership with all those people affected by any outcomes, which ensures that they co-own any processes intended to affect them.

Genuine partnership means ‘no surprises’ – partners are invited into the process as early as possible, they participate in the trial-and-error process, being exposed to mistakes that have been made in the past, as well as participating in the ongoing process of making mistakes.

This requirement of genuine partnership is hard to meet. We are used to professional diversity, diversity that is “horizontal” that is, across disciplines. We are not as used to “vertical” diversity, that is, diversity up and down various value chains. While we can imagine an architect working with an economist or political scientist, it’s much, much harder for a clinician to work with a patient as peers. The capacities required to work with vertical diversity imply a tremendous sensitivity to power dynamics and the huge distortions caused by the most simple of differences. We are in general not trained to perceive and see these differences.

Peggy Delany in her classic paper “Un-

packing the Knapsack of White Privilege”^{xxviii}) points out that, “My schooling gave me no training in seeing myself as an oppressor, as an unfairly advantaged person, or as a participant in a damaged culture. I was taught to see myself as an individual whose moral state depended on her individual moral will. My schooling followed the pattern my colleague Elizabeth Minnich has pointed out: whites are taught to think of their lives as morally neutral, normative, and average, and also ideal, so that when we work to benefit others, this is seen as work that will allow “them” to be more like “us.”

Prototyping, as a paradigmatic response to complex social challenges, therefore leads us into a profoundly personal space. In contrast to the deeply impersonalized and objective spaces of third wave strategies, a prototyping response requires a deeply embodied and personalized response. Again, we are largely not trained in such capacities.

The spread of approaches such as Social entrepreneurship, social innovation, social labs, and design thinking, mean that we are perhaps witnessing a mainstreaming of the prototyping paradigm. Already it is possible to discern a growing investment into these practices.

As the scope, size and complexity of our challenges grow, we will increasingly witness the failure of planning based responses and hence of third wave strategies. While the success of such practices may seem to be a big question, taking our cues from the world of software development and Silicon Valley, in many ways the triumph of the prototyping paradigm is inevitable.

The Inevitability of Prototyping

As the wave of complexity sweeps over our societies, the shift from planning based responses to prototyping is inevitable. This is because the planning paradigm is fundamentally unsuited to complexity. Some industries will stumble through this change without realizing that they are part of a pivotal societal shift, while other will be awake to the moment, the opportunity and the scope for a conscious shift. Some industries will find it easier to adapt to this change than other. Some industries will eagerly

embrace this shift, while others will fight it to the bitter end.

The best description I have found describing our current situation comes from Thomas Kuhn, writing in his classic account of how change occurs in the nature sciences *The Structure of Scientific Revolution*:

“Like the choice between competing political institutions, that between competing paradigms proves to be a choice between fundamentally incompatible modes of community life.

What is the process by which a new candidate for paradigm replaces its predecessor? At the start, a new candidate for paradigm may have few supporters (and the motives of the supporters may be suspect). If the supporters are competent, they will improve the paradigm, explore its possibilities, and show what it would be like to belong to the community guided by it. For the paradigm destined to win, the number and strength of the persuasive arguments in its favor will increase. As more and more scientists are converted, exploration increases. The number of experiments, instruments, articles, and books based on the paradigm will multiply.

More scientists, convinced of the new view’s fruitfulness, will adopt the new mode of practicing normal science, until only a few elderly hold-outs remain. And we cannot say that they are (or were) wrong. Perhaps the scientist who continues to resist after the whole profession has been converted has ipso facto ceased to be a scientist.”^{xxix})

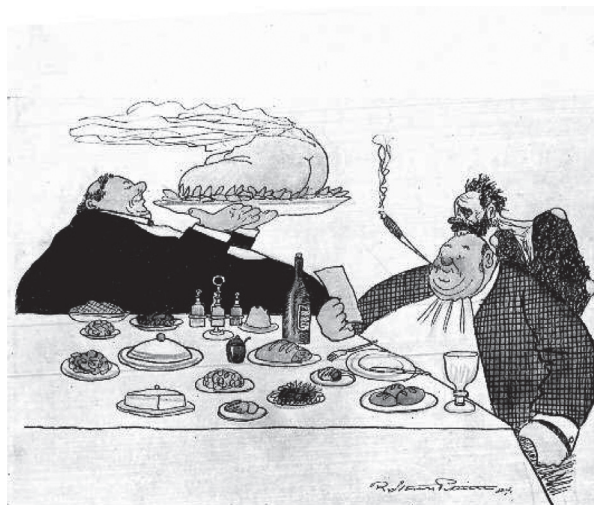
The choice between a planning paradigm and a prototyping paradigm, presents us with a choice between “fundamentally incompatible modes of community life.” What will we choose?

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Notes:

1. See Progress Towards the MDGs <http://www.worldbank.org/en/publication/global-monitoring-report/report-card/progress-towards-the-mdgs>
 2. MDG 5 sets a three-quarters reduction in maternal mortality and universal access to reproductive health by 2015.
 3. The countries included in the compendium are: Afghanistan, Bangladesh, Cambodia, China, Ethiopia, India, Mongolia, Nepal, Pakistan, Philippines, Rwanda, Sierra Leone and Timor Leste.
 4. A small anecdote illustrates this. The new UN Strategic Development Goals (SDGs) propose to lift 1.3 billion people earning under a dollar a day out of poverty in 15 years. This is the equivalent of lifting a nation the size of China out of poverty. Examining China as a case in point, over the last thirty years, we find that increasing standards of living from subsistence levels to more lower or upper middle-class levels has very significant environmental consequences. One of the sub-goals of the draft SDGs mentions energy security for the poor. During one consultation on the SDGs with African Ambassadors in New York one of the authors privately raised the issue of the energy implications of the proposed SDGs. Where would sustainable energy for 1.3 billion come from and had the costs been modeled? Taken the Chinese case, historic precedent would raise the question of unintended environmental consequences. The answer from an individual on the drafting team was that they had not been modeled. (Neither it would seem has the circle been squared with the SDGs as a goal and a legally binding environmental treaty under the auspices of the UNFCCC.) Even more disturbing, an African consultant from a multi-lateral agency advising the Ambassadors suggested publically that they follow South Africa's example and turn to coal to meet their energy needs if the global community failed to provide sufficient funding for "sustainable energy." When proponents of the SDGs are asked if the energy requirements for 1.3 billion people can be met sustainably in 15 years, the answer that "this is highly unlikely," is a politically unacceptable one. Therefore information opacity serves a critical political purpose, to obscure the reality of the situation.
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 6. It's interesting to note that the original articulation of the Waterfall model, attributed to include a caution that "one could expect up to a 100-per cent overrun in schedule and/or costs" if the additional steps were not incorporated." Palmquist, S, M., et al 'Parallel Worlds: Agile and Waterfall Differences and Similarities' Carnegie Mellon University Research Showcase at CMU October 2013 available at <http://repository.cmu.edu/sei>
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 - ii. See Vernacular Values, in Illich, I, *Shadow Work*, Marion Boyars (January 1, 1981)
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 - xii. http://www.unicef.org/health/files/Innovative_Approaches_MNH_CaseStudies-2013.pdf

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- xv. World Bank Policy Research Working Paper, "Development Goals: History, Prospects and Costs," by Shantayanan Devarajan, Margaret J. Miller, and Eric V. Swanson. , April 2008 (<http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-2819>)
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